Remarks

In the Office Action dated November 15, 2002, the Examiner rejected claims 8, 9, 12, 13, 15-19 and 22 under 35 U.S.C. § 102 as being anticipated by the U.S. Patent to Nguyen, et al. 5,491,604. The Examiner rejected claims 8-10, 12, 13, 15-20 and 22 under 35 U.S.C. § 102 as being anticipated by the U.S. Patent to Adams, et al. 5, 914,553. The Examiner rejected claims 10 and 20 under 35 U.S.C. § 103 as being unpatentable over Nguyen, et al. in view of the U.S. Patent to Ella 6,204,737. The Examiner rejected claims 10, 11, 20 and 21 under 35 U.S.C. § 103 as being unpatentable over Nguyen, et al. in view of Asano 6,316,827. The Examiner rejected claim 14 under 35 U.S.C. § 103 as being unpatentable over Nguyen, et al. or Adams, et al. in view of Capurso, et al. 6,305,779. The Examiner rejected claim 25 under 35 U.S.C. § 103 as being unpatentable over Nguyen, et al. in view of Yazdi, et al. 6,167,757. The Examiner rejected claim 26 under 35 U.S.C. § 103 as being unpatentable over Nguyen, et al. or Adams, et al.

By this Amendment, Applicants' Attorney has amended independent claim 8 to make it clear that first submicron lateral gap is a first submicron, sacrificial-film-determined, lateral gap between the first and second vertical sidewalls to increase electromechanical coupling with the first and second micromechanical structures. In like fashion, claim 13 has been amended to make it clear that the second submicron lateral gap is a second submicron sacrificial-film-determined lateral gap between the third and fourth vertical sidewalls to increase electromechanical coupling of the first and third micromechanical structures.

A sacrificial-film-determined gap is distinguishable from one determined by photolithography by the resulting structures leftover in the device. The limitation is therefore not a process limitation, but rather a device limitation indicative of structure. For instance, if the materials of the two structures separated by the gap are composed of different materials (such as plated metal and poly-Si), then photolithography would not have been used because the two photolithography steps necessary for the patterning of the two materials would not have sufficient accuracy to reliably form the submicron gap.

Alternatively, if the two structures are made of the same material, such as polysilicon, they would have been formed using two radically different procedures (again, to avoid the inaccuracies of two photolithography steps), such as LPCVD for the resonator and epitaxial growth for the electrode. Such different procedures create structures having different material characteristics, such as grain size. The relatively low temp process of LPCVD results in a relatively small grain size, while the higher temp epitaxial growth process results in a relatively larger grain size.

The Examiner acknowledges impliedly that there is no direct support for his position that the gaps disclosed in the prior art are inherently submicron, but rather only that the devices involved are on the micron scale. Micron-scale devices may have micron-scale gaps rather than sub-micron gaps. Inherency does not follow. Furthermore, it appears that lithography was used to form the comb fingers and lithography would not be able to form sub-micron gaps without further teaching (absent from the references) to address the inaccuracies introduced by two separate lithographic patterning steps.

New claim 27 recites a material of the second micromechanical structure. Support for the amendment may be found, for example, at paragraph 0056 and claim 25 as originally filed.

The Nguyen, et al. Adams, et al. and Ella references fail to disclose either plated metal or epitaxial polysilicon structures. The Asano, et al. reference fails to disclose a micromechanical structure, but rather addresses transistor technology. As such, there is an absence of a suggestion or motivation to combine. And, finally, to the extent that the Capurso, et al. and Yazdi, et al. references disclose polysilicon structures, such structures are not epitaxial polysilicon.

With regard to claim 26 and the SEG limitation - and, more generally, to recitations regarding methods of forming a device, the Examiner considered the recitation "plated metal" to be limiting and germane to patentability. References to SEG polysilicon or epitaxial polysilicon should be found limiting for the same reason that the plated metal

recitation is limiting - namely that the modifier in each case (e.g., plated or epitaxial) is descriptive of the structure after fabrication. That is, each modifier is not merely descriptive of the fabrication process, and instead limits the design beyond the manner in which the structure is formed.

Consequently, in view of the above and in the absence of art other than the art already of record in this application, Applicants' Attorney respectfully submits the application is in condition for allowance which allowance is respectfully requested.

A check in the amount of $55.00 is enclosed to cover the Petition fee. Please charge any additional fees or credit any overpayments as a result of the filing of this paper to our Deposit Account No. 02-3978 -- a duplicate of this paper is enclosed for that purpose.

Respectfully submitted,

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By_____

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Date: March 14, 2003

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Attachment

VERSION WITH MARKINGS TO SHOW CHANGES MADE

In The Claims

8. (Amended) A micromechanical device comprising:

a substrate;

a first micromechanical structure supported on the substrate and having a first vertical sidewall;

a second micromechanical structure supported on the substrate and having a second vertical sidewall; and

a first submicron, sacrificial-film-determined lateral gap between the first and second vertical sidewalls to increase electromechanical coupling of the first and second micromechanical structures.

13. (Amended) The device as claimed in claim 8 wherein the first micromechanical structure has a third vertical sidewall and wherein the device further comprises a third micromechanical structure supported on the substrate and having a fourth vertical sidewall and a second submicron, sacrificial-film-determined lateral gap between the third and fourth vertical sidewalls to increase electromechanical coupling of the first and third micromechanical structures.